



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/712,839	11/12/2003	Jong Sik Paek	GK0005	9506
7590		04/24/2006	EXAMINER	
Serge J. Hodgson		WEISS, HOWARD		
Gunnison, McKay & Hodgson, L.L.P.		ART UNIT		
Suite 220		2814		
1900 Garden Road		DATE MAILED: 04/24/2006		
Monterey, CA 93940				

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/712,839

Applicant(s)

PAEK ET AL.

Examiner

Howard Weiss

Art Unit

2814

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 28 February 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-15 and 22-25 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-15 and 22-25 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 2/28/2006
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

Attorney's Docket Number: GK0005

Filing Date: 11/12/03

Continuing Data: none

Claimed Foreign Priority Date: none

Applicant(s): Paek et al. (Kim, Seo)

Examiner: Howard Weiss

***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

2. Claims 1 to 15 and 22 to 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Boon et al. (U.S. Patent No. 6,882,021) and Tu et al. (U.S. Patent No. 6,559,539) and Komiyama (U.S. Patent No. 6,329,708).

Boon et al. show most aspects of the instant invention (e.g. Figures 1 and 4) including:

- an image sensor die **20** with a photo sensing surface **30** and bond pads **24** and a non-photo sensing surface **28**

- an insulating layer comprising a window **40**
- electrically conductive patterns **60a,60b,61** extending over said sides of said die and connecting solder balls **72** to said bond pads via holes **70**
- an encapsulant **80** encapsulating said conductive patterns and said bond pad but not covering said photo sensing surface

Boon et al. do not show the insulative layer extending over a side surface of side sensor die and attached to the non-photo sensing surface via an adhesive, the window having of glass covering it and attached to the insulative layer, the memory die attached to the non-photo sensing surface, conductive bumps interposed between the memory die and conductive patterns and the first curved portion having a curvature on the side of said image sensor die and second memory die attached as claimed.

Tu et al. teach (e.g. Figure 3) to attached a memory die **22** to the non-photo sensing surface of an image sensor die **26** and to put conductive bumps **36** interposed between the memory die and conductive patterns **16** to lower costs (Column 3 Line 64 to Column 4 Line 11). It would have been obvious to a person of ordinary skill in the art at the time of invention to attached a memory die to the non-photo sensing surface of an image sensor die and to put conductive bumps interposed between the memory die and conductive patterns as taught by Tu et al. in the device of Boon et al. to lower costs.

Komiyama teaches (e.g. Figures 7 to 9) to have an insulative layer **609a** comprising a window (the area above passivation layer **605b**) extending over a side surface of side sensor die **601a** and attached to the non-photo sensing surface via an adhesive **607a** and a first curved portion **608a** having a curvature on the side of said image sensor die **601a** and first and second memory dies **601b** attached as claimed to reduce manufacturing costs (Column 8 Lines 3 to 11). (Although not shown, other memory dies could be attached via holes **633b**; see *ibid*). It would have been

obvious to a person of ordinary skill in the art at the time of invention to have an insulative layer extending over a side surface of side sensor die and attached to the non-photo sensing surface via an adhesive and a first curved portion having a curvature on the side of said image sensor die and first and second memory dies attached as claimed as taught by Komiyama in the device of Boon et al. and Tu et al. to reduce manufacturing costs. Additionally, it is common and therefore obvious, to have glass covering the window and attached to the insulative layer.

### ***Response to Arguments***

3. Applicant's arguments filed 2/28/2006 have been fully considered but they are not persuasive. The Applicants state that the window is not claimed to be made of glass is irrelevant to the rejection. The Examiner made a mistake and has corrected it to stating the glass covers the window. Since this is just a clarification and does not change the motivation to combine the prior art, it does not constitute a new grounds of rejection.

In reference to the window in said insulator, the language in the claims state the insulative layer comprises a window which would include the insulative layer being made of the window as shown in Boon et al. When combined with the insulating layer of Komiyama, the window of Boon et al. replaces the passivation layer in Komiyama and become included as par of the insulative layer. The rejection has been modified to point this out. Since this is just a clarification and the motivation to combine the prior art has not changed, this does not constitute a new rejection.

The Applicants state that Komiyama does not explicitly teach that semiconductor chip 601a is an image sensor die and teaches away form a window in an insulative layer. However, the chips described in Komiyama are generic chips which can include varying applications including image sensing. Komiyama does not limit the use of the insulating layer to any one function chip arrangement. Disclosed examples and preferred embodiments do not constitute a teaching away from a

broader disclosure or nonpreferred embodiments. *In re Susi*, 440 F.2d 442, 169 USPQ 423 (CCPA 1971). "A known or obvious composition does not become patentable simply because it has been described as somewhat inferior to some other product for the same use." *In re Gurley*, 27 F.3d 551, 554, 31 USPQ2d 1130, 1132 (Fed. Cir. 1994). In reference to the window in the insulative layer, see the previous paragraph.

In view of these reasons and those set forth in the present office action, the rejections of the stated claims stand.

#### **Conclusion**

4. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

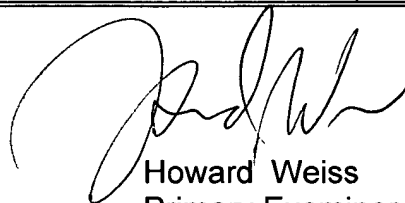
5. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Art Unit: 2814

6. Papers related to this application may be submitted directly to Art Unit 2814 by facsimile transmission. The faxing of such papers must conform with the notice published in the Official Gazette, 1096 OG 30 (15 November 1989). The Art Unit 2814 Fax Center number is **(571) 273-8300**. The Art Unit 2814 Fax Center is to be used only for papers related to Art Unit 2814 applications.
7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Howard Weiss at **(571) 272-1720** and between the hours of 7:00 AM to 3:00 PM (Eastern Standard Time) Monday through Friday or by e-mail via **Howard.Weiss@uspto.gov**. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael Fahmy can be reached on **(571) 272-1705**.
8. The following list is the Examiner's field of search for the present Office Action:

Field of Search	Date
U.S. Class / Subclass(es): 257/680	thru 4/18/2006
Other Documentation: none	
Electronic Database(s): EAST	thru 4/18/2006

HW/hw  
18 April 2006

  
Howard Weiss  
Primary Examiner  
Art Unit 2814